Amendments to the Claims:

1-18. (Cancelled)

19-48. (Cancelled)

49. (New) A method for the enhanced detection of a nucleic acid sample on a biochip, comprising the steps of:

coupling a first nucleic acid strand onto a permeation layer disposed on the surface of the biochip;

flowing a sample containing a second nucleic acid strand over an active area of the biochip to a reservoir under vacuum, wherein the active area comprises an array of individually-controlled microlocations;

hybridizing the second nucleic acid strand to the first nucleic acid strand to form a heteroduplex; and

activating the biochip for the detection of the heteroduplex.

50. (New) The method of claim 49, further comprising the step of detecting the presence of the heteroduplex.

51. (New) The method of claim 50, wherein the step of detecting the presence of the sample includes optical detection.

52. (New) The method of claim 51, wherein the optical detection includes fluorescence detection.

53. (New) The method of claim 49, wherein the first nucleic acid strand is a specific binding entity with a known sequence.

54. (New) The method of claim 49, wherein the second nucleic acid is an analyte with an unknown sequence.

55. (New) The method of claim 49, wherein the second nucleic acid is a reactant.

56. (New) An apparatus for the enhanced detection of a biological reaction between a sample and an active area of a biochip, the apparatus comprising:

a printed circuit board;

a biochip having an active area that is disposed on the printed circuit board;

an adhesive that mounts the biochip to the printed circuit board;

a permeation layer disposed on the surface of the biochip;

a fluidic system adapted to flow the sample over the active area of the biochip, wherein the fluidic system comprises

a fluid inlet port;

a fluid outlet port; and

an optical window that is disposed above the biochip and between the fluid inlet and output ports, wherein the optical window is adapted to permit radiation from the active area of the biochip to external of the apparatus.

57. (New) The apparatus of claim 56, wherein the fluidic system is in direct contact with the biochip.

58. (New) The apparatus of claim 56, wherein the fluidic system includes a flow cell.

59. (New) The apparatus of claim 58, wherein the flow cell substantially surrounds the active area of the biochip.

60. (New) The apparatus of claim 59, wherein the optical window is a ports window.

61. (New) The apparatus of claim 58, wherein the flow cell has a defined volume.

62. (New) The apparatus of claim 61, wherein the flow cell has a volume from substantially 5 to 10 microliters.

63. (New) The apparatus of claim 56, further including a reservoir attached to the outlet port.

64. (New) The apparatus of claim 63, wherein the reservoir comprises a waste tube.

65. (New) The apparatus of claim 63, wherein the reservoir comprises an expandable structure.

66. (New) The apparatus of claim 56, wherein the printed circuit board is a PCMCIA board.

67. (New) The apparatus of claim 56, further including wires connecting the biochip to the circuit board.

68. (New) The apparatus of claim 67, wherein the wires are embedded in a protective material.

69. (New) The apparatus of claim 56, wherein the fluidic system further comprises a flow cell, wherein the optical window has a planar bottom surface, the bottom surface being parallel to the upper surface of the biochip, wherein the inlet and outlet ports are above the upper surface of the biochip.